



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/723,648

11/26/2003

Allan R. Wells

89190.070503/DP-308340

8779

22851 7590 03/20/2007
DELPHI TECHNOLOGIES, INC.
M/C 480-410-202
PO BOX 5052
TROY, MI 48007

EXAMINER

MARTIN, ANGELA J

ART UNIT

PAPER NUMBER

1745

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
--	-----------	---------------

3 MONTHS

03/20/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/723,648

Applicant(s)

WELLS ET AL.

Examiner

Angela J. Martin

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-9,14 and 16-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-9,14, 16-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

This Office Action is responsive to the Amendment filed on December 26, 2006. The Applicant has amended claim 14 and added new claims 18, 19, 20. However, a new rejection is presented for the following reasons of record.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 3, 14, 16-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Abdou et al., U.S. Pat. Application Pub. 2005/0064266 A1.

Rejection of claims 1, 3, 18, 19 drawn to a method of forming a fuel cell assembly; claims 14, 16, 17 drawn to a fuel cell assembly.

Abdou et al., teach a method for forming a fuel cell assembly, comprising the steps of: a) forming a fuel cell sub-assembly module containing at least two bonded together fuel cell units, said at least two fuel cell units each including an anode, a cathode, and a membrane electrode assembly (0057-0058);

b) testing said sub-assembly module (0066); and

c) joining together a plurality of sub-assembly modules to form said fuel cell assembly (0072). A method in accordance with Claim 1 wherein each of said sub-assembly

Art Unit: 1745

modules comprises a plurality of bipolar plates assemblies (0004; 0058) interspersed with a plurality of membrane electrode assembly elements (0046). A fuel cell assembly comprising a plurality of fuel cells bonded together to form a plurality of fuel cell sub-assembly modules, wherein said plurality of fuel cell sub-assembly modules are bonded together to form said fuel cell assembly, wherein at least one of said fuel cells includes a bipolar plate assembly and a membrane electrode assembly (0057-0058). A fuel cell assembly in accordance with Claim 14 wherein at least one gasket and at least one gasketing element are positioned between each of said plurality of fuel cells (0057; 0065). A fuel cell assembly in accordance with Claim 14 wherein at least one gasket and at least one gasketing element are positioned between each of said plurality of fuel cell sub-assembly modules (0057; 0065). A method in accordance with Claim 1 wherein said at least two fuel cell units are bonded together using at least one elastomeric gasket and at least one gasketing element (0057; 0065). A method in accordance with Claim 1 wherein said plurality of sub-assembly modules are joined together using at least one elastomeric gasket and at least one gasketing element (0057; 0065).

Thus, the claims are anticipated.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

Art Unit: 1745

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4-9, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abdou et al., U.S. Pat. Application Pub. 2005/0064266 A1, in view of Stanley et al., U.S. Pat. Application Pub. 2004/0053100 A1, or Frank et al., U.S. Pat. Application Pub. 2005/0091838 A1, or Frisch et al., U.S. Pat. No. 6,761,991 B2.

Abdou et al., teach a method in accordance with Claim 1 wherein said forming step for each of said sub-assembly modules includes the steps of:

- a) providing an assembly fixture having at least one alignment element for receiving fuel cell components (0055, 0056);
- b) selecting $n+1$ number of bipolar plate assemblies and n number of membrane electrode assembly elements, each bipolar plate assembly having an anode and a cathode, wherein n is the number of said plurality of fuel cell units desired in said sub-assembly module (0072);
- c) providing an elastomeric gasket on one of said anode and cathode of $n+1$ bipolar plate assemblies (0057);
- e) installing onto said assembly fixture one of said $n+1$ bipolar plate assemblies, said alignment element engaging said one of said $n+1$ bipolar plate assemblies (0055-0056);
- f) installing onto said assembly fixture a membrane electrode assembly element into contact with said just-installed bipolar plate assembly (0055, 0056); g) installing onto said assembly fixture another of said $n+1$ bipolar plate assemblies, the anode of said one or said another of said $n+1$ bipolar plate assemblies being disposed adjacent said cathode of the other of said one or said another of said $n+1$ bipolar plate assemblies,

Art Unit: 1745

and said alignment element engaging said bipolar plate assembly being installed (0055, 0056); repeating steps f) and g) for the remaining number of provided bipolar plate assemblies and provided MEA elements to form a stack of n fuel cell units;

i) applying compressive force (0065) to said stack of n fuel cell units whilst curing said curable liquid rubber material of said at least one of said elastomeric gasket and said gasketing element to form a fuel cell sub-assembly module (0065). A method in accordance with Claim 4 wherein at least one of said membrane electrode assemblies includes gas diffusion layers (0072). A method in accordance with Claim 4 wherein said at least one alignment element is a rod (implied, since it discloses "alignment means" and a bore in Fig. 1, ref. 46), wherein each of said bipolar plate assemblies include a bore (Fig. 1, ref. 46), and wherein each of said bores receive said rod to align said bipolar plate assemblies (implied, since it discloses "alignment means" and a bore in Fig. 1, ref. 46).

Stanley et al., teach the gasketing element includes a curable liquid rubber material (sect. 0037).

Frank et al., teach curing the elastomeric gasket prior to the method (sect. 0092, 0148). It teaches including a liquid sealant during bipolar plate installation (sect. 0041). It teaches membrane electrode assembly includes gas diffusion layer (sect. 0004, 0089, 0109).

Frisch et al., teach an elastomeric gasket including a liquid sealant (col. 6, lines 30-35).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to insert the teachings of Stanley et al., or Frank et al., or Frisch et al., into the teachings of Abdou et al., because each of the secondary references teach a method of including a curable liquid rubber material for the gasket material which is advantageous to the life of the fuel cell. The prior art of record discloses that curing of a liquid sealant as the gasket helps "to prevent leakage of gases and liquids required for operation of the individual fuel cells" (Frisch et al.). In addition, the seal "is robust and can accommodate variations in tolerances and dimensions, and...can be bonded, where possible, to individual elements of the fuel cell assembly. This avoids the difficulty, labor intensive cost and complexity of manually assembling many individual gaskets into complex groove shapes" (Frank et al.).

Response to Arguments

4. Applicant's arguments with respect to above claims have been considered but are moot in view of the new ground(s) of rejection.


Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sabin et al., U.S. Pat. Application Pub. 2006/0127735 A1 teach fuel cell stacks comprising insulating gaskets, bipolar plates, and fuel cell modules, which are bonded. Osenar et al., U.S. Pat. Application Pub. 2005/0244703 A1 teach fuel cell stacks comprising insulating gaskets, bipolar plates, and fuel cell modules, which are bonded..

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela J. Martin whose telephone number is 571-272-1288. The examiner can normally be reached on Monday-Friday from 9:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


AJM